

For Using Data

Data Policy	JAMSTEC
Principal Investigator	Data Management Office
Use Constraints	See Terms and Conditions about constrain of use.
Data Citation	See Terms and Conditions about data citation.

Quality level

DMO-Processed

Instrument

Continuous sea surface water monitoring system (MR14-03 -)



Overview

Thermosalinograph measures the following surface parameters continuously.

- temperature
- salinity
- dissolved oxygen

Sea surface water is continuously pumped up at 4.5 meters depth to the sea surface monitoring laboratory and then flowed into each analyzer.

The flow rate of this system is controlled.

Measurement System

1) Temperature

Manufacturer :	Sea-Bird Scientific
Type :	SBE38
Serial No.	3852788-0457
Calibration date	2022/05/14
Measurement range :	-5 ~ 35 deg-C (ITS-90)
Accuracy :	+/-0.001 deg-C
Resolution :	0.00025 deg-C
Location :	Bow thruster room

2) Salinity (temperature/conductivity)

Manufacturer :	Sea-Bird Scientific
Type :	SBE45
Serial No.	4552788-0264
Calibration date	2023/01/12
Measurement range :	[temperature] -5 ~ 35 deg-C (ITS-90)
	[conductivity] 0 ~ 7 S/m
Accuracy :	[temperature] +/- 0.002 deg-C
	[conductivity] +/- 0.0003 S/m
Resolution :	[temperature] 0.0001deg-C
	[conductivity] 0.00001 S/m
Location :	Sea surface monitoring laboratory

3) Dissolved oxygen

Manufacturer :	JFE Advantech Co., Ltd.
Type :	RINKO II ARO-CAR
Serial No.	0035
Measurement range :	0 ~ 200%
Accuracy :	+/- 2% F.S. (non-linear)
Resolution :	0.001mgL ⁻¹ to 0.004mg L ⁻¹
Location :	Sea surface monitoring laboratory

4) Fluorescence and Turbidity

Manufacturer :	Turner Designs	
Type :	C3	
Serial No.	2300707	
Measurement range :	[chlorophyll in vivo]	0 ~ 500 $\mu\text{g L}^{-1}$
	[turbidity]	0 ~ 1500 NTU
Minimum detection limit :	[chlorophyll in vivo]	0.03 $\mu\text{g L}^{-1}$
	[turbidity]	0.05NTU
Location :	Sea surface monitoring laboratory	

Number of significant figures of data

After considering the accuracy of the sensors, the significant digit of data was changed as in the following list.

Item	Raw data	On this data
Temperature	0.0001[deg-C]	0.001 [deg-C]
Salinity	0.0001 [PSU]	0.001 [PSU]
Dissolved oxygen	0.01 [$\mu\text{mol/kg}$]	0.1 [$\mu\text{mol/kg}$]

* The unit of the dissolved oxygen was changed from ml/l into $\mu\text{mol/kg}$ since MR10-04.

Data missing period

2023/09/02 23:41 - 2023/09/05 17:49

Calibration Information

1) Salinity

Comparison between salinity data measured with TSG and that measured with salinometer is presented in the following data and figure. Water for salinometer is sampled from bypass line of TSG. Salinometer used for this analysis is Autosal model 8400B manufactured by Guildline Instruments Inc.

Refer to 'Fig. MR23-06C_tsg_btl_sal' and 'MR23-06C_tsg_btl_sal.txt'.

2) Dissolved Oxygen

Comparison between DO data measured with TSG and that measured by Winkler method is presented in the following table and figure.

Refer to 'Fig. MR23-06C_tsg_btl_do' and 'MR23-06C_tsg_btl_do.txt'.

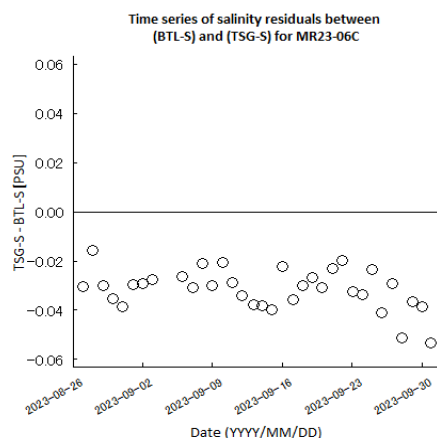
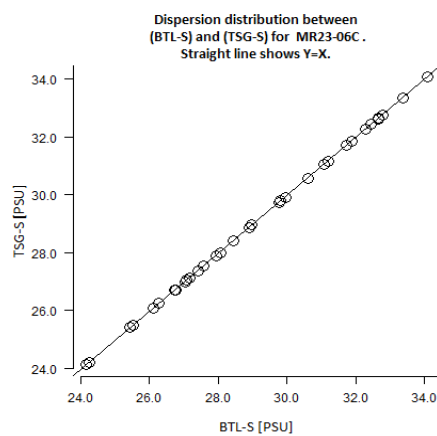


Fig. MR23-06C_tsg_btl_sal

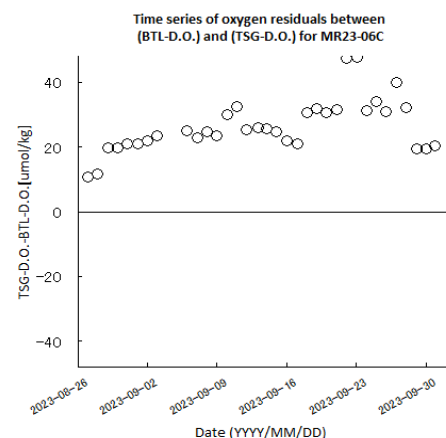
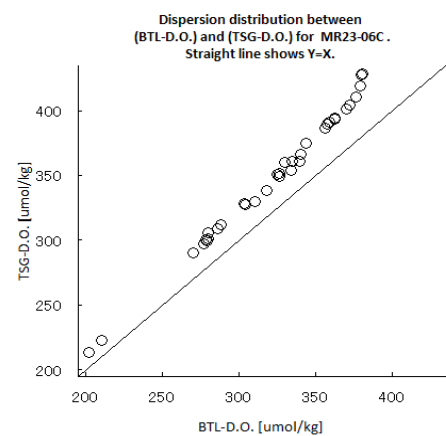


Fig. MR23-06C_tsg_btl_do

Data processing

DMO-Processed data are flagged after the data check process shown below:

1) Range check

For details about range set of temperature, salinity and oxygen data, please see the following reference of NODC (National Oceanographic Data Center) .

Quality control and processing of historical oceanographic temperature, salinity, and oxygen data. P. Boyer and Levitus, 1994. NOAA technical report NESDIS ; 81

* <https://repository.library.noaa.gov/view/noaa/13443>

2) Visual check

If an value were extremely out from time-series plot of each variable or were affected by ambient air due to unstable flow of sampled water, it may be put flag "A" which means doubtful value.

About this data

1) This cruise obtained data of fluorescence and turbidity in addition to data of temperature, salinity and dissolved oxygen.

Detailed results of sensor calibration are also stored.

If you would like these data set, please contact DMO at "dmo@jamstec.go.jp".

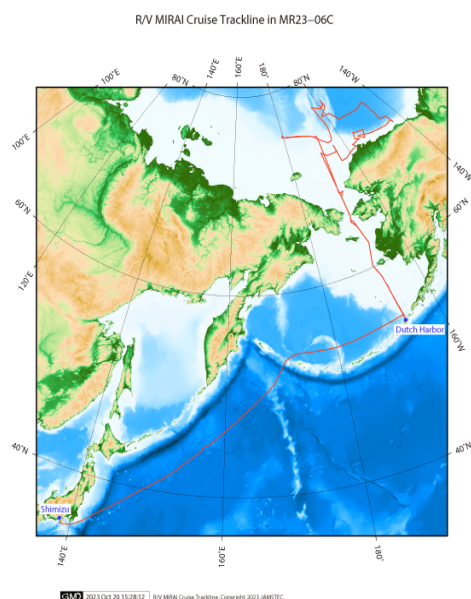
2) Salinity and dissolved oxygen data obtained during the following term were flagged "A" because of noise in the data due to filter maintenance.

2023/09/09 03:09 - 2023/09/09 03:21

2023/09/17 03:15 - 2023/09/17 03:35

2023/09/30 00:19 - 2023/09/30 00:24

Related Information



MR23-06C

Ship Name:

MIRAI

Period:

2023/08/25 - 2023/10/04

Chief Scientist:

Amane Fujiwara (JAMSTEC)

Proposal:

Arctic Expedition for Environmental Studies
Observational study of the Arctic environmental changes: Pacific-Arctic interaction, biogeochemical transport, mixing and marine ecosystem

Quantification of the microplastic inventory in the waters of the western Arctic Ocean and microplastic influx from the Pacific Ocean

Changes in clouds and aerosols over the ice-free Arctic Ocean

Possibility of the expanding distribution in plankton and fishes associated with sea ice reduction in the Pacific sector of the Arctic Ocean

Observation of air-sea-wave-ice interaction over the Pacific Arctic region

Investigating the physical and ecophysiological basis of fall phytoplankton blooms in the Chukchi and Beaufort seas

Nitrogen Fixation in a Changing Arctic Ocean An Overlooked Source of Nitrogen

Exploring microplankton interactions and their functional roles in a changing Arctic

Determining the contribution of siphonophores to mesopelagic backscatter in the Arctic

Better understanding of climate-driven changes of biogeochemical dynamics in the western Arctic Ocean via R/V Mirai 2023 Cruise A perspective of stable carbon isotope

Temporal variations of the carbonate chemical components the Arctic Ocean within summertime

Observation of water vapor isotopic ratios
Observation of atmospheric greenhouse gases and related species in the North Pacific region

Format Description for TSG DMO

Each data file contains one line header and daily observation data.

Header part

No.	Column	Content	Format	Remarks
1	1	Header ID	a1	fixed as '#'
2	3 - 6	Data ID	a4	TSG
3	8 - 22	Cruise ID	a15	e.g. MRYX-XX_legx
4	68 - 71	Number of data lines	i4	
5	72 - 73	Terminator	a2	[CR][LF]

Data part

No.	Column	Content	Format	Unit	Remarks
1	1 - 8	Date	i4,i2,i2		YYYYMMDD (UTC)
2	10 - 13	Time	i2,i2		hhmm (UTC)
3	15 - 23	Latitude	i2,a1,f5.2,a1		dd-mm.mmN(S)
4	25 - 34	Longitude	i3,a1,f5.2,a1		ddd-mm.mmE(W)
5	35 - 45	Temperature	f11.3	deg-C	ITS-90
6	46 - 56	Salinity	f11.3	PSU	PSS-78
7	57 - 67	Dissolved oxygen	f11.1	μ mol/kg	
					1- 6 : space
					7 : flag of date/time
					8 : flag of latitude/longitude
					9 : flag of temperature
					10 : flag of salinity
					11 : flag of dissolved oxygen
8	68 - 78	Flag	i11		[CR][LF]
9	79 - 80	Terminator	a2		

* This format has been applied since MR10-04 cruise of R/V Mirai.

* Temperature, Salinity, Dissolved oxygen: Missing value is presented by '-5', and error value is presented by '-9'.

Definition of Quality Control Flags

- Observed Level Flags
 - 0 - accepted value
 - 1 - range outlier (outside of broad range check)
 - A - doubtful value
 - N - missing value
- Date and time flag (Thermosalinograph only)
 - 0 - accepted data and time
 - 1 - failed duplicate/missing/incorrect date and time
- Position flag (Thermosalinograph only)
 - 0 - accepted position
 - 1 - failed estimated ship speed check including missing/incorrect position